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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/069,830 | 07/16/2002 | Peter Hessling | LEN-021022 | 5379 |

7590

07/12/2005

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EXAMINER

LOPEZ, FRANK D

ART UNIT

PAPER NUMBER

3745

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,830

Applicant(s)

HESSLING, PETER

Examiner

F. Daniel Lopez

Art Unit

3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12,13,15,17-19 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12,13,15,17-19 and 21-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Response to Amendment

Applicant's arguments filed April 28, 2005 have been fully considered but they are not deemed to be persuasive.

Applicant's arguments with respect to claims 12, 13, 15 and 17-23 have been considered but are deemed to be moot in view of the new grounds of rejection.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

Claim 23 is rejected under 35 U.S.C. § 102(b) as being anticipated by Bunyard (see discussion below).

Claim Rejections - 35 USC § 103

Claims 12, 13, 15, 17-19, 21 and 22 are rejected under 35 U.S.C. § 103 as being unpatentable over Bunyard in view of Nichols. Bunyard discloses a pneumatic actuator comprising a one-piece shaft (13) rotatable in an axial direction perpendicular to an axis of a cylinder; a one-piece piston (20), movable in the cylinder and including piston teeth (19) extending along the axis, wherein the piston teeth engage shaft teeth (18) of the shaft; wherein the shaft has two different diameter bearing sites (14, 15) mounted directly in the housing at different diameter bearing areas; wherein the piston fixes the shaft in its axial direction by positive engagement of sides (e.g. fig 6) of the piston forming a groove engaging peripheral grooves in the shaft beside the shaft teeth; wherein one (15) of the bearing sites has a greatest diameter of the shaft, and the other bearing site has a diameter smaller than the diameter of the shaft teeth; but does not disclose that the other bearing site has a greatest diameter of the shaft; that the piston is made of plastic; or that the shaft is held in the bearing areas, without additional fasteners.

Nichols teaches, for a pneumatic actuator comprising a shaft (44) rotatable in an axial direction perpendicular to an axis of a cylinder; a one piece piston (62, 66), movable in the cylinder and including piston teeth (74) extending along the axis, wherein the piston teeth engage shaft teeth (60) of the shaft; wherein the shaft has two bearing sites mounted directly in the housing at bearing areas; wherein the piston fixes the shaft in its axial direction by positive engagement of sides (72) of the piston forming a groove engaging sides of the toothed area, without additional fasteners; wherein the toothed area of the shaft has a larger diameter than the bearing sites; that both bearing site has a same diameter; that the piston is made of plastic; and that the shaft is held in the bearing areas, without additional fasteners.

A comparison of the bearing sites of Bunyard and Nichols follows. The shaft of Bunyard has essentially three diameters, a smallest diameter being the other bearing site, a next larger diameter being the shaft teeth and the largest being the one bearing site, with the different diameter bearing areas. This allows ease of assembly, since the other bearing site and the shaft teeth can slip into the larger diameter bearing area easily, but requires two different tools to make the different diameter bearing areas, and different settings to make the different diameter bearing sites. The shaft of Nichols has essentially two diameters, the smallest diameter being the bearing sites and the largest diameter being the shaft teeth. This allows ease of machining, since the same diameter bearing areas can be made with a same tool, and same diameter bearing sites can be made with a same setting, but the assembly is harder, since there is a tight fit between the shaft and both bearing areas. Since there appears to be a tradeoff between the ease of assembly of Bunyard and the ease of machining of Nichols, the two different ways of making the shaft of Bunyard and Nichols are functionally equivalent. It is understood that in applying the same diameter of bearing sites, of Nichols, to Bunyard, the bearing sites must be a largest diameter, to allow the shaft teeth to slide through the bearing area.

Since the different diameter bearing sites of Bunyard and the same diameter bearing sites of Nichols are functionally equivalent (as discussed above) in the rotatable actuator art, it would have been obvious at the time the invention was made to one

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having ordinary skill in the art to make the other bearing site of Bunyard the same largest diameter as the one bearing site, as taught by Nichols, as a matter of engineering expediency (i.e. for ease of machining).

Since Bunyard and Nichols are both from the same field of endeavor, and since Nichols teaches that the piston can be made of plastic; it would have been obvious at the time the invention was made to one having ordinary skill in the art to make the piston of Bunyard using plastic, as taught by Nichols, as a matter of engineering expediency.

Since Bunyard and Nichols are both from the same field of endeavor, and since Nichols teaches that the shaft can be held in the bearing areas, without additional fasteners; it would have been obvious at the time the invention was made to one having ordinary skill in the art to hold the shaft of Bunyard in the bearing areas, without additional fasteners, as taught by Nichols, as a matter of engineering expediency. and that the

Claim 20 is rejected under 35 U.S.C. § 103 as being unpatentable over Bunyard in view of Nichols, as applied to claim 12 above, and further in view of EP 598,689. The modified Bunyard discloses all of the elements of claim 20, including that the bearing sites include working areas sealed from the exterior by sealing rings in grooves in the bearing areas of the housing; but does not show the sealing rings in grooves in the shaft.

EP 598,689 teaches, for a pneumatic actuator comprising a shaft (11) rotatable in an axial direction perpendicular to an axis of a cylinder; a one-piece piston (10), movable in the cylinder and including piston teeth (26) extending along the axis, wherein the piston teeth engage shaft teeth (22) of the shaft; wherein the shaft has bearing sites mounted directly in the housing at bearing areas (13, 14); wherein the bearing sites include working areas sealed from the exterior by sealing rings in grooves; that the grooves are in the shaft.

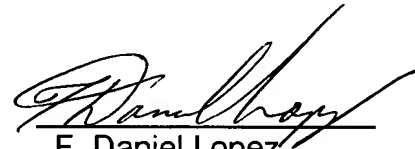
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Since the grooves of the sealing rings of Bunyard and EP 598,689 are functionally equivalent in the piston art, it would have been obvious at the time the invention was made to one having ordinary skill in the art to locate the grooves of the modified Bunyard in the shaft, as taught by EP 598,689, as a matter of engineering expediency.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Lopez whose telephone number is 571-272-4821. The examiner can normally be reached on Monday-Thursday from 6:15 AM -3:45 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Look, can be reached on 571-272-4820. The official fax number is 571-273-8300. Any inquiry of a general nature should be directed to the Help Desk, whose telephone number is 1-800-PTO-9199.

A handwritten signature in black ink, appearing to read "F. Daniel Lopez", is written over a horizontal line.

F. Daniel Lopez
Primary Examiner
Art Unit 3745
July 08, 2005